Environmental Studies Program: Ongoing Study

Title	A Vulnerability Index to Scale Effects off Offshore Renewable Energy on Marine Mammals and Sea Turtles of the U.S. West Coast (VIMMS) (PC-21-04)
Administered by	Pacific OCS Region
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Procurement Type(s)	Firm Fixed-Price Contract
Conducting Organization(s)	Southall Environmental Associates, Inc.
Total BOEM Cost	$299,688
Performance Period	FY 2021–2023 (18 months)
Final Report Due	February 4, 2023
Date Revised	August 26, 2021
PICOC Summary	
Problem	There are currently no large-scale floating wind farms in areas of high marine mammal or sea turtle species diversity/occurrence. This makes it difficult to quantify the vulnerabilities of these species to this infrastructure.
Intervention	Implement a species-specific vulnerability index to enable realistic and meaningful quantification and interpretation of the current status of marine mammal species along the U.S. West Coast by including environmental context-specific factors like species population, species habitat use, compensatory abilities, and other relevant biological characteristics and environmental stressors.
Comparison	This index can be used to compare to the results of complementary efforts by CEC and OPC.
Outcome	This vulnerability index can be applied to inform the siting of offshore wind call and lease areas, as well as inform mitigative strategies.
Context	Central and Northern California, Oregon, and Washington

BOEM Information Need(s): BOEM has already received three unsolicited applications to install floating wind turbines, one offshore Oregon and one each offshore northern and central California. While data exist on the distribution of marine mammal and sea turtle species along the west coast of the US, there is currently no collated vulnerability assessment available on which to appropriately scale the potential impacts to these species from this nascent industry. BOEM needs to acquire this information to support the environmentally responsible development of any permitted offshore renewable floating energy siting and leasing. Impact assessment information is required under the NEPA, ESA, and MMPA. This profile addresses or supports 3 of the 5 BOEM Strategic Information Needs and at least 4 of the 7 Strategic Framework Criteria for Study Development and Approval.

Background: The overarching challenge with the development of new industries or technologies is trying to anticipate their effects on the environment.

Vulnerability to effects (e.g., displacement, entanglement etc.) will vary between species because of where and when they occur along the Pacific OCS and what they are doing (migrating, feeding etc.). Species sensitivity to climate change has been discussed in the literature (Hossain et al. 2018; Dickinson et al. 2014; Foden et al. 2013) and similar approaches can be undertaken to assess the vulnerability of the different species to inform proposed floating wind development activities in the Pacific OCS. Impacts to marine mammals and sea turtles are always of high concern to stakeholders. This study will take the first step in evaluating all available and applicable marine mammal and sea turtle data, using expert elicitation to inform identified data gaps, as appropriate, and then use this information to rank each vulnerability factor (for example, species population, species habitat use and compensatory abilities, potential masking and other environmental stressors) and determine an overall potential vulnerability rating for these marine mammal and sea turtle species. This information will feed directly into BOEM's environmental assessments and decision documents and will help BOEM identify species of concern, as well as topics for future studies related to offshore floating wind impacts on marine mammals and sea turtles in the Pacific OCS.

BOEM has funded, and continues to fund, studies related to the distribution and abundance of Pacific OCS marine mammals (OCS Study #s 2019-042; 2018-044; 2018-025; 2016-035; 2014-003; Barlow et al. 2014). This study will allow for the use of the data collected from BOEM's past efforts to inform current and future decisions related to offshore renewable energy development in the Pacific OCS. Information from this study with allow for the potential avoidance of areas of high overlap with species of interest, as well as identifying potential mitigative strategies, for example, opportunities to require seasonal installation to reduce the potential for impacting certain species.

Objectives:

1. Develop a vulnerability index for marine mammals and sea turtle species that occur offshore Central and Northern California, Oregon, and Washington. The index will take in to account environmental context-specific factors like species population, species habitat use, compensatory abilities, and other environmental stressors.

2. Develop a visual representation of the levels of concern (for example, a red-orange-green geospatial overlay or matrix) that will act as a basis for informing the selection of offshore renewable energy sites.

Methods: Species vulnerability would be assessed using a trait-based approach (Foden et al. 2019, 2013; Adams et al. 2017; Laidre et al. 2008), potentially using a risk assessment framework that presents a biologically based and scientifically current process with logical elements to integrate relevant biological, acoustical, ecological, and environmental contextual variables to inform the siting of offshore floating wind development within a marine mammal and sea turtle population context.

The vulnerability index will be developed by ranking key vulnerability factors including species distribution, species density estimates, species population, species population status (i.e. threatened, endangered or not), strong seasonal patterns in distribution and/or density (species habitat use), as has been done to evaluate risk to marine mammals from seismic surveys by Southall et al. (2018) and to birds by Adams et al. (2017). The ranking of each factor for all species will be independently evaluated by a selected group of experts per factor.

Species evaluated in the index will include all marine mammal and sea turtle species expected to regularly occur offshore Central and Northern California, Oregon, and Washington. At a minimum, these

will include blue, fin, humpback, gray, sperm, common bottlenose, , and harbor porpoise; sea otters, and California sea lions. Additionally, sea turtle species expected to regularly occur in these areas including, green, hawksbill, leatherback, loggerhead and Olive Ridley sea turtles, will be evaluated in the index.

Specific Research Question(s):

1. What are the current levels of vulnerability of marine mammal and sea turtle species offshore Central and Northern California, Oregon, and Washington?

2. Which species are most vulnerable?

3. Where are the specific areas of vulnerability?

4. Are there any mitigations that could reduce species vulnerability to consider during siting of potential offshore energy development activities?

Current Status: The contract was awarded to Southall Environmental Associates, Inc. on August 4, 2021. A post-award meeting will be held in late August or early September 2021.

Publications Completed: None

Affiliated WWW Sites: None

References:

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